BABENKO, A.S.; TOLMACHEV, V.N.; DZIZIN, A.N.

Sulfate salts of nitrone. Ukr. khim. zhur. 29 no.7:702-708 '63.
(MIRA 16:8)

1. Khar'kovskiy politekhnicheskiy institut im. V.I. Lenina.
(Nitrone)

GUT, A.M., inzh.; BABENKO, [illegible], inzh.

Redesigning a headframe without stopping mine hoisting operations. Shakht.stroi. 9 no.5:20-23 My '65. (MIRA 18:6)

1. Trest Krivorozhstal'konstruktsiya (for Gut). 2. Trest Ukrmontazhorgstroy (for Babenko).

BABENKO, A.Ye.

Increasing the productivity of labor. Kons. i ov. prom. 12 no.1: 35-37 Ja '57. (MLRA 10:5)

1. Stalingradskiy konservnyy zavod.
(Canning industry) (Labor productivity)

BABENKO, A.Ye.

Transportation of tomato pulp at the Stalingrad Canning Factory.
Kons. i ov. prom. 14 no.4:13-14 Ap '59. (MIRA 12:5)

1. Stalingradskiy konservnyy zavod.
(Stalingrad--Tomatoes--Transportation)

BAHENKO, A.Ye.

Seven-year plan for our factory. Kons. i ov. prom. 14 no.8:36-37 Ag '59. (MIRA 12:9)

1.Stalingradskiy konservnyy zavod.
(Stalingrad Province--Canning industry)

BABENKO, A.Ye.

Fully utilize available means for increasing the labor productivity. Kons.i ov.prom. 15 no.7:30-32 Jl '60. (MIRA 13:6)

1. TSentral'naya eksperimental'no-tekhnologicheskaya laboratoriya upravleniya pishchevoy promyshlennosti Stalingradskogo sovnarkhoza.
(Stalingrad Province--Canning industry--Labor productivity)

BABENKO, A.

Means of increasing labor productivity in meat combines. Mias.ind. SSSR 31 no.3:45-46 '60. (MIRA 13:9)

1. Eksperimental'no-tekhnologicheskaya laboratoriya pishchevoy promyshlennosti Stalingradskogo sovnarkhoza.
(Stalingrad Province--Meat industry--Labor productivity)

BABENKO, A.Ye.

Experiment in the planning of the volume of production on the base of the standard costs of processing. Kons. i ov.prom. 18 no.9: 35-36 S '63. (MIRA 16:9)

1. TSentral'naya eksperimental'no-tekhnologicheskaya laboratoriya Nizhne-Volzhskogo soveta narodnogo khozyaystva.
(Canning industry--Management)

BABENKO, B. M.

AID P - 1972

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 21/25

Author : Babenko, B. M., Eng.

Title : Selection of control cable cross sections for voltage circuits of protective relays of 110- and 35-kv transmission lines.

Periodical : Energetik, 4, 35-38, Ap 1955

Abstract : On the basis of formulas expressing the relationship between the voltage drop and the length of the control cable, the author builds graphs for various cross sections of the cables for both 110- and 35-kv lines. From these graphs limiting lengths of cables for various cross-sections are derived. Two graphs.

Institution: None

Submitted : No date

BABKOV, V.M., inzh.

Replies to V.M. Kedrin's article "Power supply networks for the self-needs of thermal electric power plants with generators exceeding 25 MW". Elek. sta. 35 no.6:89-90 Je '64. (MIRA 18:1)

BABENKO, D. K.

BABENKO, D. K. - "Timber-Vegetation Conditions of the Tersko-Kumskiy Sands and Prospects for Their Afforestation and Exploitation." Min Higher Education USSR, Saratov Agricultural Inst, Saratov, 1955
(Dissertation for the Degree of Candidate in Agricultural Sciences)

SO: Knizhnaya Letopis', No. 33, 1955, pp 85-87

BABENKO, Demyan Alekseyevich; TEPLENKO, Sarra Isaakovna; CHIBISHEV, Leonid Dmitriyevich; TSIEULEVSKIY, P.I., red.

[Electrician's manual on the winding of asynchronous electric motors] V pomoshch' elektriku-obmotchiku asinkhronnykh elektrodvigatelei. Moskva, Energiia, 1965. 255 p. (MIRA 18:8)

BABENKO, Dem'yan Alekseyevich; TEPLENKO, Sarra Isakovna; CHIBISHEV, Leonid Dmitriyevich; MARSHAK, Yo.L., retsenzent; RUBO, L.G., red.; BORUNOV, N.I., tekhn. red.

[Manual for electricians and armature winders working on three-phase asynchronous electric motors] V pomoshch' elektriku-obmotchiku trekhfaznykh asinkhronnykh elektrodvigatelei. Moskva, Gosenergoizdat, 1962. 174 p. (MIRA 15:9)

(Electric motors, Induction--Repairing)
(Electricians--Handbooks, manuals, etc.)

BABENKO, D.N., inzhener; KOSNIKOV, N.I., agronom-ekonomist.

Results of testing foreign pickup balers. Sel'khozmashina no.5:28-32 My '57. (MLRA 10:5)

1.Kubanskiy nauchno-issledovatel'skiy institut ispytaniya traktorov i sel'skokhozyaystvennykh mashin.
(Harvesting machinery)

SUKHORUKOV, I.F.; RABENKO, E.M.; GAVRINA, M.V.

Surface phenomena at the boundary between a carbon material and coal tar pitch. TSvet.met. 38 no.3:65-68 Mr '65.
(MIRA 18:6)

Babenko, F. N.

3-8-9/34

AUTHOR: Babenko, F. N., Dotsent

TITLE: Meeting the Participants of the Revolutionary Struggle in the Trans-Carpathian Area (Vstrecha s uchastnikami revolyutsionnoy bor'by v Zakarpat'ye)

PERIODICAL: Vestnik Vysshey Shkoly, 1957, # 8, pp 51-52 (USSR)

ABSTRACT: The chair of KPSS History of the Uzhgorod University (Uzhgorodskiy universitet) in cooperation with the Oblast' Chapter of the Society for Dissemination of Political and Scientific Knowledge (Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy) conducted a scientific session devoted to the 40th Anniversary of the October Revolution.

The session took place in the village Velikiy Bychkov, Rakhovo District, and was opened by District Committee Secretary Yu. I. Latskorikh. Dotsent F. N. Babenko, in charge of the chair of history, and B. I. Spivak, Candidate of Historical Science and Instructor, delivered lectures on the significance of the October Revolution. University Instructors V. V. Khaynas and K. A. Kutsenko told of the Communist struggle and the help rendered by the USSR to the working people of the

Card 1/2

3-8-9/34

Meeting the Participants of the Revolutionary Struggle in the Trans-Carpathian Area

Trans-Carpathian area. The concluding lecture was given by G.I.Gerich, secretary of the party organization of the lumber industry,on the development of the Velikiy Bychkov village under Communist rule.

ASSOCIATION: State University, Uzhgorod (Uzhgorodskiy gosudarstvennyy universitet)

AVAILABLE: Library of Congress

Card 2/2

GANICHKIN, A.M.; BABENKO, G.A.; CHARUGIN, A.I.; DOVGYALLO, N.D.; BUNIN, E.I.; SMOLYAK, L.G.

In memory of Professor V.M.Bogoslavskii. Khirurgiia no.10:94-95 O '53. (MLRA 6:11)

(Bogoslavskii, Vladimir Matveevich, 1888-1953)

BABENKO, G. A.

Dissertation: "Trace Elements of the Brain in Humans and Animals." Cand Med Sci, Inst of Physiology, Acad Sci USSR, Leningrad, 1954. Referativnyy Zhurnal--Khimiya, Moscow, No 14, Jul 54.

SO: SUM No. 356, 25 Jan 1955

BABENKO, G.A. [Babenko, H.O.]

Changes in the cobalt content of the blood and organs of dogs in radiation sickness. Ukr.biokhim.zhur. 32 no.1:93-99 '60. (MIRA 13:6)

1. Department of Biological Chemistry of the Stanislav Medical Institute.

(COBALT IN THE BODY) (RADIATION SICKNESS)

BABENKO, G.A. (USSR)

"Disorders of the Cobalt, Copper, Manganese and Zinc Metabolism in the Organism of some Animal Species Injured by Various Factors of Ionizing Irradiation."

Report presented at the 5th Int'l. Biochemistry Congress, Moscow, 10-16 Aug 1961.

BABENKO, G.A.

Copper content of some organs of animals in radiation injury. Vop. med. khim. 8 no.2:134-139 Mr-Ap '62. (MIRA 15:4)

1. Chair of Biochemistry, State Medical School, Stanislav.
(COPPER IN THE BODY) (RADIATION SICKNESS)

BABENKO, G.A., dotsent

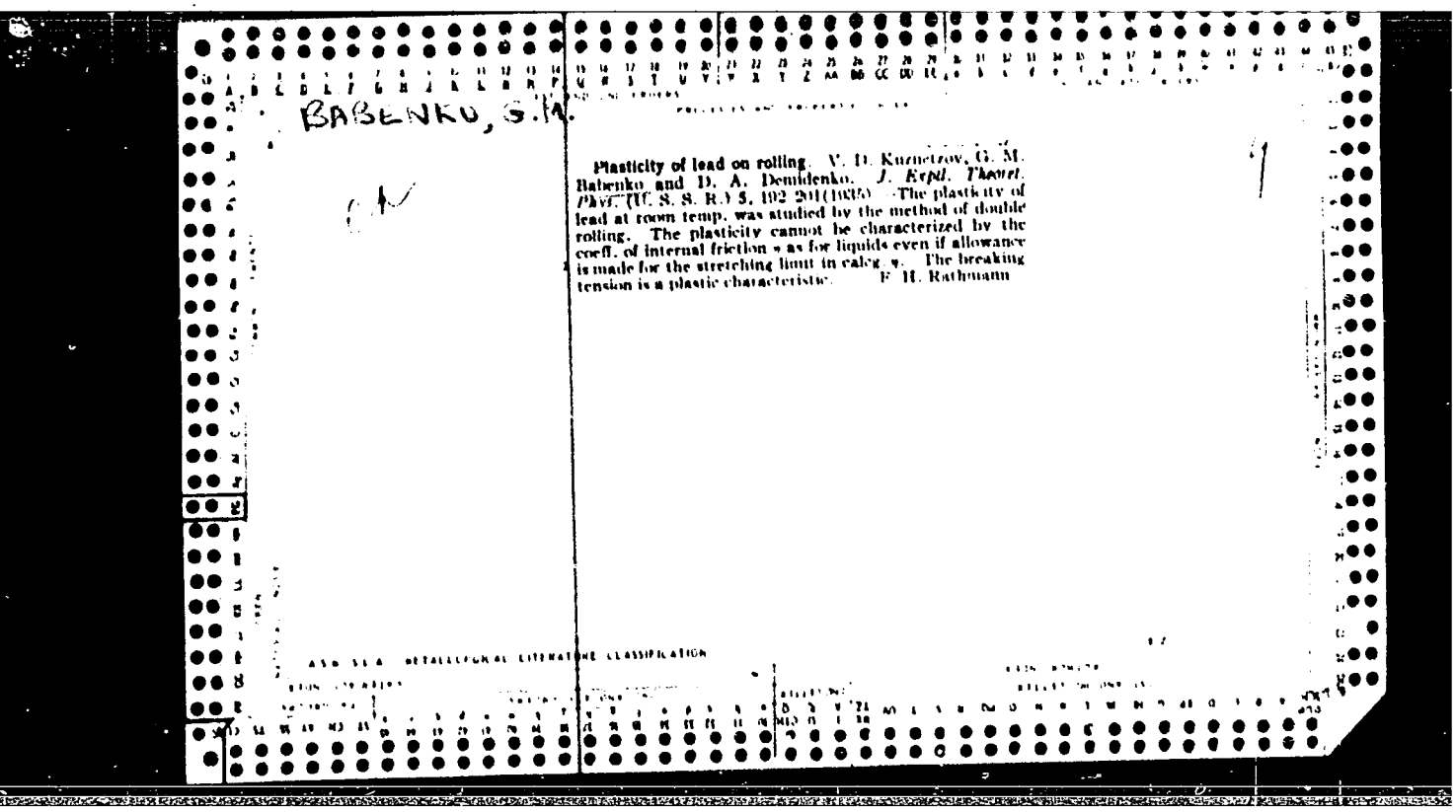
Cobalt metabolism in the body of some species of animals during radiation sickness. Vrach. delo no.5:67-71 My '62. (MIRA 15:6)

1. Kafedra biokhimii (zav. - dotsent G.A. Babenko) Stalinslavskogo meditsinskogo instituta.
(RADIATION SICKNESS) (COBALT IN THE BODY)

BABENKO, G.A.[Babenko, H.O.]; KARPLYUK, Z.V.

Effect of the removal of the pancreas on the manganese content of dog tissues and organs. Ukr. biokhim. zhur. 35 no.5:732-736 '63. (MIRA 17:5)

1. Department of Biochemistry of Ivano-Frankovsk Medical Institute.



BABENKO, G.M.

Plasticity of lead on rolling. V. D. Kuznetzov, G. M. Babenko and D. A. Demidenko. *J. Exptl. Theoret. Phys. (U. S. S. R.)* 5, 192-201(1935).—The plasticity of lead at room temp. was studied by the method of double rolling. The plasticity cannot be characterized by the coeff. of internal friction η as for liquids even if allowance is made for the stretching limit in calcg. η. The breaking tension is a plastic characteristic. F. H. Rathmann

ZAVGOR[illegible], A.F.; SEMGDA, G.T.; [illegible], G.N.

[illegible] pinching in viticulture. [illegible] no.4:154-156 Jl-Ag '57. (MLRA 10:9)

[illegible]yanskiy sel'sko-khozyaystvennyy tekhnikum. (Viticulture)

SVIRKUNOV, V.N.; BABENKO, G.N.

Bilateral tubal pregnancy. Zdrav. Bel. 6 no.11:64 N '60.
(MIRA 13:12)

1. Iz Yezerischenskoy rayonnoy bol'nitsy (glavnyy vrach V.N. Svirkunov).
(PREGNANCY, EXTRAUTERINE)

BABENKO, G.O. [Babenko, H.O.]

Copper, manganese and zinc content in the organs of guinea pigs in the acute form of radiation sickness. Ukr. biokhim. zhur. 33 no.4:576-585 '61. (MIRA 15:6)

1. Department of Biochemistry of Stanislav Medical Institute.

(COPPER IN THE BODY)
(ZINC IN THE BODY)
(MANGANESE)
(RADIATION SICKNESS)

BABENKO, G.N.; AGAFONOV, M.D. (Oktyabr' skoye Ryazanskoy oblasti); VARAKSA, M.S. (g.Novozybkov Bryanskoy oblasti); LYSOV, R.A. (g. Novozybkov Bryanskoy oblasti); KONDRATENKO, V.I. (g. Drogobych)

1. Remarks on textbooks. Fiz.v shkole 23 no.1:102-103 Ja-F '63. (MIRA 16:4)
(Physics—Textbooks)

S/103/63/024/001/012/012
D201/D308

AUTHORS: Babenko, G. S. and Smirnov, A. M. (Moscow)

TITLE: Effect of the viscosity of a liquid on the dynamic properties of a hydraulic pipeline

PERIODICAL: Avtomatika i telemekhanika, v. 24, no. 1, 1963, 112-115

TEXT: Results of an experimental investigation of the effect of liquid viscosity ν in a hydraulic pipeline on the speed of sound, c, from which the effect of ν on the amplitude-frequency characteristic, representing the dynamic properties of the pipeline can be found. The following substances were investigated: paraffin, transformer oil, MC-20 (MS-20) oil and mixtures of the latter two. The dependence $c = f(\nu)$ is approximately $c = (1.43 - 0.053\,\nu) \times 10^5$ cm/sec. With increasing viscosity the speed of sound in the hydraulic pipeline decreases, the friction losses increase. As a result, the amplitude-frequency characteristic and the frequency of the first resonant maximum considerably decrease. The approxi-

Card 1/2

mate equation for c gives only a qualitative picture of amplitude frequency characteristics. There are 4 figures and 2 tables.

SUBMITTED: March 29, 1962

Card 2/2

USSR/Cultivated Plants - Fruits. Berries. M-6

Abs Jour : Ref Zhur - Biol., No 20, 1958, 91803

Author : Babenko, G.V.

Inst : Uman Agricultural Institute.

Title : New Frost Resistant Stocks for Wild Dwarf Apple Trees.

Orig Pub : Sadovodstvo, Vinogradarstvo i vinodeliye Moldavii, 1957, No 6, 50-52.

Abstract : Studies of seven uncultivated dwarf apple trees at the Uman Agricultural Institute, grown on deeply leached clay chernozem soil with the subsurface waters at a depth of 10 meters, showed that the most productive ones are Malus virginiana, M. sargenti, M. baccata and M. zumi. The last one can be used in the middle belt of the USSR because of its frost resistance. M. sargenti being tolerant of salt can be used in salty soils.

Card 1/2

BORODATYY, I.; BABENKO, I.

Studying the technical servicing of the tractor-driven multipurpose machinery. Prof.-tekh. obr. 22 no.10:34 O '65. (MIRA 18:10)

1. Direktor grigoripolisskogo sel'skogo professional'no-tekhnicheskogo uchilishcha No.9, Stavropol'skiy kray (for Borodatyy).

25(2) SOV/117-59-5-14/30

AUTHOR: Babenko, I.F., Engineer

TITLE: A Lathe Chuck With a Hydraulic Clamp

PERIODICAL: Mashinostroitel', 1959, Nr 5, pp 25-26 (USSR)

ABSTRACT: Detailed design information is given on a clamping device for lathe chucks, developed by the author at the Alma-Atinskiy zavod tyazhelogo mashinostroyeniya (Alma-Ata Heavy Machine Building Plant). The clamp, a "hydromanipulator" for the chuck (the design of the chuck is described in "Broshyura Nr 33" VPTI Mintyazhmash, 1956) (Figure 1) is not attached to the machine spindle or the chuck, and can be controlled from a central station with a load accumulator or a group-pump, serving a group of several machines. The weight accumulator is shown in the diagram (Figure 3), and the chuck and the manipulator operating together, in a photograph (Figure 2). The manipulator body consists of a work cylinder and a slide-valve cylinder with a distribution slide valve controlling the clamping and releasing. The design of the chuck and the manipulator permits a clamping and releasing of the work with

Card 1/2

A Lathe Chuck With a Hydraulic Clamp

different force; manual clamping and releasing with a wrench, in the case of thin-wall work, or for preliminary clamping for setting, fast displacement and quick exchange of the jaws. The clamping of work (a machine part) requires 6.9 seconds and the releasing of it - 4.4 seconds (using standard chucks, for the same operation 16.8 and 9.2 seconds are required). There are 2 diagrams, 1 photograph, and 1 table.

BABENKO, I.I.

Air distributors on locomotives should be switched to free-running operation. Elek.i tepl. tiaga 6 no.11:44 N '62. (MIRA 16:1)

1. Mashinist-instruktor po avtotormozam depo Nikopol' Pridneprovskoy dorogi.

(Railroads--Brakes)

BABENKO, I.I., kand.tekhn.nauk; ZUBAREVA, T.V., inzh.

Means of regulating water diversion from artesian wells. Gidr. i mel. 14 no.4:39-46 Ap '62. (MIRA 15:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut gidrotekhniki i melioratsii im. A.N.Kostyakova.
(Chernyye Zemli--Artesian wells--Equipment and supplies)

ARABAYEV, E.I.; BABENKO, I.S.; GLADKOV, G.M.; KAZAKOV, I.G.; SEYDAKHMATOV, O.S.; SKRYNNIK, V.K.; TABALDYYEV, R.D., kand. ekon. nauk, otv. red.

[Wage system on the collective beet farms of Kirghizistan; using the example of the "Krasnyi Oktiabr'" Collective Farm of Sokuluk District] Sistema oplaty truda v sveklo-seiushchikh kolkhozakh Kirgizii; na primere kolkhoza "Krasnyi oktiabr'" Sokulukskogo raiona. Frunze, Izd-vo "Ilim," 1964. 92 p. (MIRA 18:1)

BABENKO, I.T., fel'dsher.

Simple utensil for heating paraffin. Fel'd. i akush. 22 no.11:44-45 N '57. (MIRA 11:2)

(PARAFFINS) (PHYSICAL THERAPY)

BABENKO, Ivan Il'ich; KRAVTSOV, G.Ya., red.

[Water supply of livestock farms] Vodosnabzhenie zhivotnovodcheskikh ferm. Moskva, Izd-vo "Kolos," 1964. 286 p.
(MIRA 17:7)

BABENKO, K. (Maj.)

"Determining the Causes of Aircraft Radio Equipment Defects," Vest. Vozd. Flota, No.10, 1954

Summary of article D 230533, 12 May 55

BABENKO, K.

AID P - 2248

Subject : USSR/Aeronautics

Card 1/1 Pub. 135 - 12/19

Author : Babenko, K., Lt. Col.

Title : Organization of the study of aircraft radio equipment

Periodical: Vest. vozd. flota, 7, 64-68, Jl 1955

Abstract : This is a general description of the study of aircraft radio equipment from the technical and tactical point of view. The author takes the example of his unit to discuss various phases of this study. Several names are mentioned.

Institution: None

Submitted : No date

BABENKO, Kh.I., kand.med.nauk; MERKULOVA, M.I., kand.med.nauk

Testosterone propionate and its use in rosacea keratitis. Oft. zhur. 12 no.5:270-273 '57. (MIRA 13:6)

1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta glaznykh bolezney imeni prof. Girshmana (direktor - chlen-korrespondent AMN SSSR prof. I.I. Merkulov).
(TESTOSTERONE) (CORNEA--DISEASES)

BABENKO, K. I.

USSR/Mathematics - Functions, Approximation of 1947

"On the 'Suspended' Approximation, by Means of Polynomials, of Functions Continuous on the Entire Number Axis," N. I. Akhiyezer, K. I. Babenko, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVII, No 4

Gives brief mathematical discussion of succession of functions approaching the function in question, when satisfying certain limitations. Submitted by Academician S. N. Bernshteyn, 30 Jan 1947.

PA 53T48

Source: Mathematical Reviews, Vol 10 No. 4

BABENKO, K. I. 262T62

USSR/Mathematics - Mixed Tricomi Equation 21 Jul 53

"Tricomi Problem in a Class of Generalized Solutions of Euler-Darboux Equations," L. V. Ovsyannikov

DAN SSSR, Vol 91, No 3, pp 457-460

For a definite class of solutions of the eq $yu_{xx} + u_{yy} = 0$ (E), the author solves in a certain sense the familiar Tricomi problem, i.e., one of the principal boundary-value problems for the Euler-Darboux eq (E), of determining in a "mixed" region S the solution of eq (E) in accordance with assigned values of this solution on an open contour CAKB, where AKB is an "arbitrary" curve and

262T62

AC and BC are arcs of the characteristics of eq (E). Cites doctoral dissertation (1952) of K. I. Babenko. Presented by Acad V. I. Smirnov 23 May 53.

BABENKO, K.I.; GEL'FAND, I.M.

Several remarks on hyperbolic systems. Nauch. dokl. vys. skoly; fiz.-mat. nauki no.1:12-18 '58. (MIRA 12:3)

1.Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Differential equations, Partial)

16(1)
AUTHOR: Babenko, K.I. SOV/155-58-2-3/47

TITLE: On the Entropy of an Analytic Function Class (Ob entropii odnogo klassa analiticheskikh funktsiy)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 2, pp 9-16 (USSR)

ABSTRACT: The paper joins the investigations of Kolmogorov [Ref 1] on the ε-entropy. Let B_M be the class of functions analytic in a simply connected domain G, for which $|f(z)| \leq M$, $z \in G$. Let Q be a domain lying in the interior of G with the Jordan boundary Γ. Let the metric be introduced by $\rho(f,g) = \max_{z \in Q} |f(z)-g(z)|$. Let H_ε be the ε-entropy of the class B_M. The author shows that

$$H_\varepsilon = \frac{\log^2 \frac{1}{\varepsilon}}{\log \frac{R}{r}} + O\left(\log^2 \frac{1}{\varepsilon}\right),$$

where R and r are the outer and inner radius of the ring on which G-Q is mapped univalently.
The proof bases on the construction of rational functions

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On the Entropy of an Analytic Function Class SOV/155-58-2-3/47

approximating the functions $f(z) \in B_M$ on the compactum Q and increasing not too quick outside of Q. 6 lemmas are formulated before the theorem.
There is 1 Soviet reference.

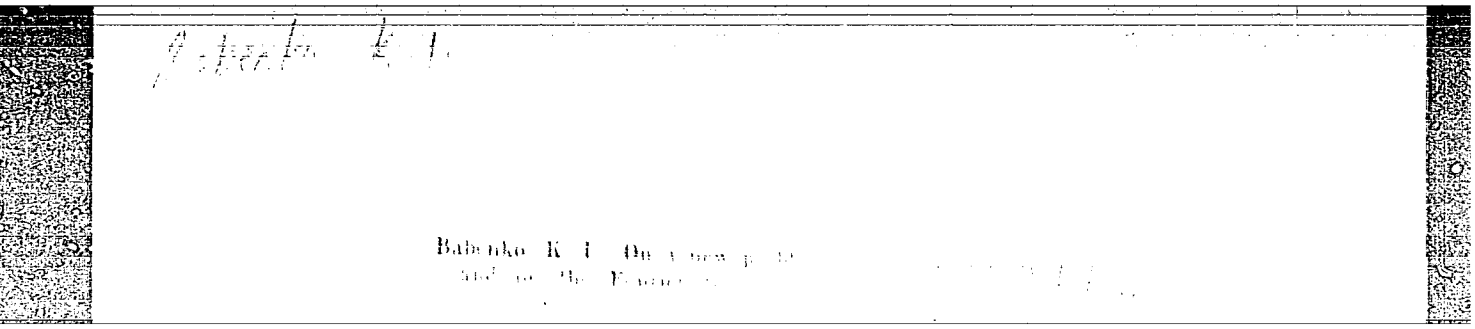
ASSOCIATION: Matematicheskiy institut imeni V.A.Steklova AN SSSR (Mathematical Institute imeni V.A.Steklov, AS USSR)

SUBMITTED: January 16, 1958

Card 2/2

BABENKO, K. I.

"Theory of Mixed-Type Equations," Uspekhi Matematicheskikh Nauk, Vol 8, No 2 (54), pp 159-167.



AUTHOR: Babenko, K.I. SOV/38-22-5-4/10

TITLE: On the Best Approximation of an Analytic Function Class (O nailuchshikh priblizheniyakh odnogo klassa analiticheskikh funktsiy)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1958, Vol 22, Nr 5, pp 631-640 (USSR)

ABSTRACT: $B^{(r)}$ $(r=1,2,\ldots)$ denotes the class of functions $f(z) = \sum_{k=0}^{\infty} c_k z^k$ analytic in $|z|<1$ and satisfying the condition $|f^{(r)}(z)| \leqslant 1$, $|z|<1$.

Let $E_n(\varrho;f)$ be the best approximation of the function $f(z)$ in the circle $|z| \leqslant \varrho \leqslant 1$ by polynomials of at most $(n-1)^{st}$ order. Let $E_n(1;f) = E_n(f)$.

Theorem: For $f(z) \in B^{(r)}$ and $n \geqslant r$ holds

$$\sup_{f \in B^{(r)}} E_n(|z|;f) = \frac{z^n}{n(n-1)\ldots(n-r+1)}$$

$$\sup_{f \in B^{(r)}} E_n(f) = \frac{1}{n(n-1)\ldots(n-r+1)} .$$

Card 1/2

On the Best Approximation of an Analytic Function Class SOV/38-22-5-4/10

Beside the two theorems and several lemmas necessary for the proof, the principal theorem of Stechkin of [Ref 4] is proved in a simple manner with the aid of the Cauchy formula.

There are 5 references, 3 of which are Soviet, 1 German, and 1 French.

PRESENTED: by M.A.Lavrent'yev, Academician

SUBMITTED: December 12, 1957

Card 2/2

BABENKO, K. I. (Moscow)

"Numerical Methods in Gas Dynamics."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

S/020/60/132/02/01/067

AUTHOR: Babenko, K. I.

TITLE: Approximation of Periodical Functions of Several Variables by Trigonometric Polynomials

PERIODICAL: Doklady Akademii nauk SSSR. 1960, Vol. 132. No. 2, pp. 247-250

TEXT: In the author's opinion the difficulties of the approximation theory of periodical functions of several variables are due to the absence of correctly formulated problems. By the example of appromimations of periodical functions in L_2 he shows that the usual formulation of the problem for the functions of one variable is not transferable to the functions of serval variables, that, on the contrary, the situation for functions of several variables is just opposite to that for functions of one variable. The author describes ways for determining extremum systems of functions for the approximation of periodical functions of a given class.
A. N. Kolmogorov is mentioned in the paper.

Card 1/2

S/020/60/132/02/01/067

Approximation of Periodical Functions of Several Variables by Trigonometric Polynomials

There is 1 American reference.

ASSOCIATION: Matematicheskiy institut imeni V. A. Steklova AN SSSR (Mathematical Institute imeni V. A. Steklov AS USSR)

PRESENTED: December 31, 1959, by M. V. Keldysh, Academician

SUBMITTED: December 31, 1959

Card 2/2

16.4100 16.4200

81687
S/020/60/132/05/03/069

AUTHOR: Babenko, K. J.

TITLE: Approximation of a Certain Class of Periodic Functions of Several Variables by Trigonometrical Polynomials

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5, pp. 982-985

TEXT: The paper starts from the preceding publication (Ref.1) of the author and uses the former notations. The author considers the approximation of periodic functions which satisfy the condition

$$(1) \qquad \sup_{x \in K} \left| \frac{\partial^{l_1 + \cdots + l_m} f(x)}{\partial x_1^{l_1} \cdots \partial x_m^{l_m}} \right| \leq 1$$

or

$$(9) \qquad \left| \frac{\partial^{l_{j_1} + l_{j_2} + \cdots + l_{j_s}} f(x)}{\partial x_{j_1}^{l_{j_1}} \cdots \partial x_{j_m}^{l_{j_m}}} \right| \leq 1, \quad 1 \leq j_1 < j_2 < \cdots < j_s \leq m, \quad 1 \leq s \leq m$$

Card 1/2

81687

S/020/60/132/05/03/069

Approximation of a Certain Class of Periodic Functions of Several Variables by Trigonometrical Polynomials

He proves the existence of trigonometric polynomials with at most M exponential functions such that there exist estimations of the type

$$|f(x) - T(x)| \leq C \frac{\log^{m-1+\ell(\beta-1)} M}{M^{\ell}}$$

The result is used in order to construct quadrature formulas. N. M. Korobov is mentioned by the author.
There are 2 Soviet references.

ASSOCIATION: Matematicheskiy institut imeni V. A. Steklova AN SSSR (Mathematical Institute imeni V. A. Steklov AS USSR)

PRESENTED: December 31, 1959, by M. V. Keldysh, Academician

SUBMITTED: December 31, 1959

Card 2/2

S/020/60/132/06/02/068
C111/C222

AUTHOR: Babenko, K.I.

TITLE: Some Classes of Spaces of Infinitely Differentiable Functions

PERIODICAL: Doklady Akademii nauk SSSR,1960, Vol 132, No. 6, pp. 1231-1234

TEXT: The author considers spaces of the type S introduced in (Ref. 1). Let S_1^m be the space of entire functions $f(z)$, $z = x + iy$, for which there holds

(7) $$|f(z)| \leqslant \exp\left\{l(A|y|) - m(B|z|)\right\} ,$$

where A and B are constants depending on f. Let $xl'(x) \uparrow \infty$, $xm'(x) \uparrow \infty$.
Theorem 1 : Let m(x) satisfy the condition

(8) $$x^{-k} \int_0^x \frac{m(u)}{u^2}\, du \downarrow 0$$

In order that the space S_1^m is not trivial, it is necessary and sufficient that for at least one $\theta > 0$ it holds :

Card 1/2

BARENKO, K.I. (Moskva); VOSKRESENSKIY, G.P. (Moskva)

Numerical method for the spatial calculation of a hypersonic gas-flow around bodies. Zhur. vych. mat. i mat. fiz. 1 no.6:1051-1060 N-D '61. (MIRA 16:7)

16,4200

26761
S/038/61/025/004/002/003
C111/C444

AUTHOR: Babenko, K. I.

TITLE: On an inequality in the theory of Fourier integrals

PERIODICAL: Akademiya nauk SSSR. Izvestiya, Seriya matematicheskaya, v.25, no.4, 1961, 531-542

TEXT: The classical result of Hausdorff - Young for a function $f(x)$, $f(x + 2\pi) = f(x)$, satisfying the condition

$$\int_{-\pi}^{\pi} |f(x)|^p \, dx < \infty, \quad 1 < p \leq 2,$$

is

$$\left(\sum_{-\infty}^{\infty} |c_n|^q \right)^{\frac{1}{q}} \leq \left(\frac{1}{2\pi} \int_{-\pi}^{\pi} |f(x)|^p \, dx \right)^{\frac{1}{p}}, \qquad (1)$$

where c_n are the Fourier coefficients of $f(x)$, $q = \frac{p}{p-1}$.

Titchmarsh transferred this result to Fourier integrals and established the inequality

$$\left(\frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} |\tilde{f}(y)|^q dy \right)^{\frac{1}{q}} \leq \left(\frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} |f(x)|^p \, dx \right)^{\frac{1}{p}}, \qquad (2)$$

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where $\tilde{f}(y)$ is the Fourier transform of $f(x)$ and $\int_{-\infty}^{\infty} |f(x)|^p \, dx < \infty$ is assumed.

The author proves the theorem: If q is an even integer, then

$$\| \tilde{f} \|_q \leq (2\pi)^{\frac{1}{2}(\frac{1}{q} - \frac{1}{p})} \frac{p^{\frac{1}{2p}}}{q^{\frac{1}{2q}}} \| f \|_p . \qquad (33)$$

There $\| f \|_r = \left(\int_{-\infty}^{\infty} | f(x) |^r \, dx \right)^{\frac{1}{r}}$.

It follows that for $q = 2e$, e an integer, instead of (2), the inequality

$$\left(\sqrt{\frac{q}{2\pi}} \int_{-\infty}^{\infty} | \tilde{f}(y) |^q \, dy \right)^{\frac{1}{q}} \leq \left(\sqrt{\frac{p}{2\pi}} \int_{-\infty}^{\infty} | f(x) |^p dx \right)^{\frac{1}{p}} . \quad (3)$$

On an inequality...

is proved. The equality sign in (33) holds for $f(x) = e^{-ax^2 + ibx}$, $a > 0$, e arbitrary such that (3) is a strict inequality in opposition to (2).

There is one non-Soviet-bloc reference. The reference to English-language publication reads as follows: Titchmarsh, Ye. K. : Vvedeniye v teoriyu integralov Fur'ye, [Introduction to the theory of Fourier integrals], Moscow, 1948.

ASSOC: Matematicheskiy institut im. V. A. Steklova, Ak. nauk SSSR [Institute of Mathematics im. V. A. Steklov of the Academy of Sciences USSR]

SUBMITTED: February 11, 1960

Card 3/3

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31109
S/208/61/001/006/006/013
B112/B138

AUTHORS: Babenko, K. I., Voskresenskiy, G. P. (Moscow)

TITLE: A numerical method of calculating a spatial supersonic flow around bodies

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 1, no. 6, 1961, 1051-1060

TEXT: The system $\partial\vec{X}/\partial t + A\partial\vec{X}/\partial\xi + B\partial\vec{X}/\partial\eta + \vec{Y}$, which corresponds to the flow around a conic body, is reduced to a system of difference equations

$$X^{n+1}_{m+1,l} + X^{n+1}_{m,l} + 2\varkappa_1\alpha A^{n+1/2}_{m+1/2,l}(X_{m+1,l} - X_{m,l})^{n+1} + \tag{6}$$

$$+\frac{\varkappa_2}{2}\gamma B^{n+1/2}_{m+1/2,l}(X_{m+1,l+1} - X_{m+1,l-1} + X_{m,l+1} - X_{m,l-1})^{n+1} =$$

$$= -2\tau Y^{n+1/2}_{m+1/2,l} + X^{n}_{m+1,l} + X^{n}_{m,l} - 2\varkappa_1\beta A^{n+1/2}_{m+1/2,l}(X_{m+1,l} - X_{m,l})^{n} -$$

$$-\frac{\varkappa_2}{2}\delta B^{n+1/2}_{m+1/2,l}(X_{m+1,l+1} - X_{m+1,l-1} + X_{m,l+1} - X_{m,l-1})^{n},$$

α, β, γ, δ are positive numbers which satisfy the relations $\alpha + \beta = 1$,

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A numerical method of calculating a...

$\gamma + \delta = 1$. The system (6) is solved by iteration according to the following scheme:

$$X^{n+j/k}_{m+1,\,l} + X^{n+j/k}_{m,\,l} + 2\varkappa_1\alpha A^{n+j/2k}_{m+1/2,\,l}(X_{m+1,\,l} - X_{m,\,l})^{n+j/k} + \quad (7)$$
$$+ \frac{\varkappa_2}{2}\gamma B^{n+j/2k}_{m+1/2,\,l}(X_{m+1,\,l+1} - X_{m+1,\,l-1} + X_{m,\,l+1} - X_{m,\,l-1})^{n+(j-1)/k} =$$
$$= -2\tau Y^{n+j/2k}_{m+1/2,\,l} + X^{n}_{m+1,\,l} + X^{n}_{m,\,l} - 2\varkappa_1\beta A^{n+j/2k}_{m+1/2,\,l}(X_{m+1,\,l} - X_{m,\,l})^{n} -$$
$$- \frac{\varkappa_2}{2}\delta B^{n+j/2k}_{m+1/2,\,l}(X_{m+1,\,l+1} - X_{m+1,\,l-1} + X_{m,\,l+1} - X_{m,\,l-1})^{n},$$

Numerical computations are carried out for the cases $M_\infty = 3.5$, $\alpha_0 = 5^\circ$, 10°, 15°, 19°, and $M_\infty = 3.53$, $\alpha_0 = 5^\circ$ (M_∞ = Mach number, α_0 = angle of attack of the body). Z. Ye. Svishchev and E. I. Nazhestkin are thanked for assistance. There are 15 figures, 1 table, and 1 Soviet reference.

SUBMITTED: June 3, 1961

Card 2/2

BABENKO, K.I.

One inequality in Fourier's integral theory. Izv.AN SSSR.Ser.mat. 25 no.4:531542 Jl-Ag '61. (MIRA 14:8)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR.
(Fourier's series) (Inequalities (Mathematics)

Babenko, K.I.

PHASE I BOOK EXPLOITATION SOV/6201

Vsesoyuznyy s"yezd po teoreticheskoy i prikladnoy mekhanike. 1st, Moscow, 1960.

Trudy Vsesoyuznogo s"yezda po teoreticheskoy i prikladnoy mekhanike, 27 yanvarya -- 3 fevralya 1960 g. Obzornyye doklady (Transactions of the All-Union Congress on Theoretical and Applied Mechanics, 27 January to 3 February 1960. Summary Reports). Moscow, Izd-vo AN SSSR, 1962. 467 p. 3000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Natsional'nyy komitet SSSR po teoreticheskoy i prikladnoy mekhanike.

Editorial Board: L. I. Sedov, Chairman; V. V. Sokolovskiy, Deputy Chairman; G. S. Shapiro, Scientific Secretary; G. Yu. Dzhanelidze, S. V. Kalinin, L. G. Loytsyanskiy, A. I. Lur'ye, G. K. Mikhaylov, G. I. Petrov, and V. V. Rumyantsev; Resp. Ed.: L. I. Sedov; Ed. of Publishing House: A. G. Chakhirev; Tech. Ed.: R. A. Zamarayeva.

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(25)

PURPOSE: This book is intended for scientific and engineering personnel who are interested in recent work in theoretical and applied mechanics.

COVERAGE: The articles included in these transactions are arranged by general subject matter under the following heads: general and applied mechanics (5 papers), fluid mechanics (10 papers), and the mechanics of rigid bodies (8 papers). Besides the organizational personnel of the congress, no personalities are mentioned. Six of the papers in the present collection have no references; the remaining 17 contain approximately 1400 references in Russian, Ukrainian, English, German, Czechoslovak, Rumanian, French, Italian, and Dutch.

TABLE OF CONTENTS:

SECTION I. GENERAL AND APPLIED MECHANICS

SECTION II. MECHANICS OF FLUIDS AND GASES

BABENKO, K.I.; RUSSANOV, V.V. (Moscow)

"The finite difference methods of solving three-dimensional problems of gas dynamics"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

BABENKO, K. I.

"Investigations of three-dimensional supersonic gas flow around conic bodies."

report submitted for 11th Intl Cong of Theoretical & Applied Mechanics & General Assembly, Munich, 30 Aug-5 Sep 64.

L 51051-65 EWT(l)/EWP(m)/EWA(d)/FCS(k)/EWA(l) Pd-1 S/ 36

ACCESSION NR AM5005931 BOOK EXPLOITATION B+1

[illegible] (Professor); [illegible]skiy, Georgiy Pavlovich;

[illegible]mov, Aleksandr Nikolayevich, [illegible]

TOPIC TAGS: ideal gas flow, gas dynamics, supersonic flow, axisymmetric flow, mathematics, computer programming, aerodynamics

PURPOSE AND COVERAGE: This book is devoted to an actual problem of modern gas dynamics--calculating the field of flow around a smooth body placed arbitrarily in relation to the direction of air flow. The book cites the results of research conducted for a number of years between authors on the development and practical application of a method of finite differences for solution of spatial problems

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TABLE OF CONTENTS (abridged):

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NO REF SOV: 015 OTHER: 007

Card 3/3

MERKULOV, I.I., prof.; BABENKO, Kh.I., kand.mod.nauk

Some problems of pupillary reaction to light. Vop.neirooft. 7: 87-152 '61. (MIRA 14:9)

(PUPIL (EYE))

BABENKO, K.K.; MARKOVA, L.P.

Stratigraphy and geological age of deposits stretching under red-colored strata of southwestern Turkmenistan. Izv. AN Turk. SSR no.2:73-77 '58. (MIRA 11:4)

1.Ob"yedineniye "Turkmenneft" i Turkmenskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta.
(Turkmenistan--Geology, Stratigraphic)

BABENKO, K.K.

Basic features of the geology and oil potential of the Lenin field of the Turkmen S.S.R. Geol. nefti i gaza 6 no.11:23-27 N '62. (MIRA 15:12)

1. Turkmenskoye neftepromyslovoye ob"yedineniye.

BABENKO, Kh. L.

ZAVADOVSKIY, A.M., kandidat tekhnicheskikh nauk; BABENKO, Kh.L., inzhener.

Some condiderations concerning S.V. Grishchuk's article. Energomashinostroenie 3 no.9:48 S '57. (MIRA 10:10)
(Gas turbines)

ZAVADOVSKIY, A.M., kand.tekhn.nauk; BABENKO, Kh.L., inzh.

Note on the publication of the Central Scientific Research Institute for Boilers and Turbines entitled "Directives on aerodynamic calculation of the blading in stationary gas turbines." Energomashinostroenie 3 no.12:43 D '57. (MIRA 11:1)

(Gas turbines)

BABENKO, Kh. L.

96-1-7/31

AUTHORS: Zavadovskiy, A.M., Candidate of Technical Sciences and Babenko, Kh.L., Engineer.

TITLE: The Influence of Leakage on the Operation of a Turbine Stage (Vliyaniye protechek na rabotu turbinnoy stupeni)

PERIODICAL: Teploenergetika, 1958, Vol.5, No.1, pp. 28 - 31 (USSR)

ABSTRACT: In turbine stages of the type illustrated in Fig. 1, there is an axial gap between the end surface of the diaphragm and the roots of the working blades. The flow through the blading thus has a leakage path into the space surrounding the bucket-wheel. If there are equalising aperatures in the bucket-wheel, the working medium in the stage can flow both through the gap and through the apertures. Tests made with an unbladed disc, later confirmed by tests on an experimental turbine, showed that leakage through the peripheral annular gap between the root zone and the diaphragm results from the pumping effect of the rotating disc.
Leakage influences the main flow. Gas leaking back from the bucket-wheel space into the flow part alters its direction of motion and is accelerated mainly at the expense of the energy of the main flow. The influence of this kind of leakage would be expected to decrease with increase in the degree of reaction

Card1/3 of the stage. Gas leaking from the flow path into the bucket-

wheel space causes hardly any distortion of the flow structure, and moderate leakage scarcely impairs the stage efficiency. Tests were made at the Central Boiler Turbine Institute (TsKTI) to investigate the operation of a stage with the two kinds of leakage. The blading used was that described in a previous article in Teploenergetika, 1957, No.6. The gaps considered are those indicated in Fig. 1. The tests were first made on a bucket-wheel without equalising holes and later on a wheel with five equalising holes initially of 15 mm diameter and later of 25 and 35 mm diameter. Graphs of the stage efficiency for various amounts of leakage into the flow path from the space are given in Fig.2. Similar curves for stages with different degrees of reaction are given in Figs. 3 and 4. This kind of leakage affects the stage efficiency differently, depending on the clearance in the blade zone. This is seen in Fig.5, which graphs stage efficiency as a function of leakage for various clearances.

The small influence of leakage into the bucket-wheel space from the flow path is confirmed by the additional data graphed in Fig.6, which was obtained for different gap sizes and degrees of reaction. The curve given in Fig. 9 shows that the steam-handling capacity of the stage is little affected by leakage.

96-1-7/31

The Influence of Leakage on the Operation of a Turbine Stage.

There are 9 figures and 2 Slavic references.

ASSOCIATION: TsKTI

AVAILABLE: Library of Congress.

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Tsentral'nyy Kotloturbinnyy Institut

BABENKO, Kh.L., inzh.; ZAVADOVSKIY, A.M., kand.tekhn.nauk.

Measures for increasing economic operation of steam turbines. Elek.sta. 28 no.9:3-6 S '57 (MIRA 10:11)
(Steam turbines)

BABENKO, Kh. L., Cand of Tech Sci -- (diss) "Interaction of Streams of the Working Medium and Axial Stress in the Turbine Stage," Leningrad, 1959, 10 pp (Leningrad Polytechnical Institute im M. I. Kalinin) (KL, 8-60, 116)

AUTHORS: Zavadovskiy, A.M., Candidate of Technical Sciences
Babenko, Kh.L., Engineer

TITLE: A Method of Designing the Flow Parts of Steam and Gas Turbines (Metod proyektirovaniya protochnoy chasti parovykh i gazovykh turbin)

PERIODICAL: Teploenergetika, 1959, Nr 2, pp 23-28 (USSR)

ABSTRACT: It is not yet possible to calculate all the characteristics necessary for stage design and it is, therefore, recommended to use the so-called model stage method. An appropriate model stage is taken as the basis for designing a group of stages or, in some cases, the entire flow part of the turbine by making appropriate changes in the dimensions of the initial stage. The aerodynamic characteristics that are required of each model stage are stated in Eq (1) to (8). In addition, data should be availableabout the model stage from which the flow prcperties of the designed stages can be determined to a first approximation. It is important to include the necessary strength calculations at an early stage. The number of stages may be selected on the basis of identical heat drop on all the stages

A Method of Designing the Flow Parts of Steam and Gas Turbines

developed from a single model stage. The design of the flow part is developed by comparing different variants of change of diameters, heat drops and stage shapes subject to certain stated requirements. Eq (10) is derived for the isc-entropic heat drop on the stage with allowance for inlet velocity. The factors that govern the heat drop in the stage are easily seen from this formula. A design procedure is then recommended. The diameter and length of the last stage are determined from Eq (11) and the necessary approximate strength calculations are made. The number of stages is selected and a law of stage diameter ratio is taken. The various other characteristics that are required can then be determined. Finally the critical speed of the rotor is determined. Various other requirements that occur in the calculations are stated and finally a numerical example of a design is given. Typical blading performance curves that are required for the purpose of the calculations are given in Fig 1 and 2. The design of stages for variable operating

 conditions is then considered in a similar

A Method of Designing the Flow Parts of Steam and Gas Turbines

way, using the same basic equations. If model stages corresponding to the given conditions of operation are not available the design must be based on the velocity triangle method. As it is not possible to calculate all the losses in the flow part when the velocity triangle method of design is used, it is necessary to make use of experimental data obtained during tests on blading mounted on turbine wheels. Then it is not necessary to design each stage of the turbine anew but in this case too, the same principles can be adopted as are used in the model stage method. Here again, the total heat drop in the turbine is divided into several parts, each corresponding to a group of similar stages. A single stage is then designed for each group and forms a basis for the design of the rest of the group. The general principles are the same as in the previous methods. The formula necessary for design by this method is then given and typical curves required in the calculations are also given in Fig 4, 5 and 6. Expression (17) is used to determine the efficiency of

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A Method of Designing the Flow Parts of Steam and Gas Turbines

the elementary stage. Further steps in the design procedure are explained and finally a numerical example of design is given. There are 6 figures and 3 Soviet references.

ASSOCIATION: Tsentral'nyy Kotloturbinnyy Institut (Central Boiler Turbine Institute)

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E194/E455

26.2120

AUTHORS: Zavadovskiy, A.M., Candidate of Technical Sciences, Babenko, Kh.L., Engineer and Agafonov, V.A., Engineer

TITLE: Formation of the Flow Path of a Turbine by Undercutting Blades of the Initial Stage

PERIODICAL: Energomashinostroyeniye, 1960, No.7, pp.19-21

TEXT: Work of the Central Boiler Turbine Institute has shown that in forming and designing the flow paths of turbines, it is advisable to proceed by the method of model stages. In this method, the initial stage is modified by undercutting the runner blades from the periphery and the guide vanes from the shaft end. The pitch of the guidevanes at the mean diameter is maintained constant. This method may be applied to a stage, to a group of stages, or even to a turbine as a whole. Before a stage can be used as an initial stage, certain information is required about its performance and design characteristics. The characteristics of the initial stage and the corrections to them resulting from undercutting can, in principle, be calculated or determined by a test on a rotating turbine, which is very much more satisfactory

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Formation of the Flow Path of a Turbine by Undercutting Blades of the Initial Stage

in the present state of knowledge. Similarly, it is currently desirable to create a series of initial stages to satisfy the requirements of steam and gas turbine design. This article gives information about one of the initial stages developed in the Central Boiler Turbine Institute and shows that under certain conditions, considerable changes may be made in the geometrical dimensions of the initial stages without appreciable change in the efficiency, flow characteristics, reaction and other characteristics. The initial stage has cylindrical guide vanes and corresponds closely to profile TN-2 (TN-2) of the Central Boiler Turbine Institute. The runner blades are twisted; Fig.1 shows their profiles at five sections along the height. During the course of the tests, the runner blades were shortened from the top, while the number of blades and angle of installation remained unaltered. Correspondingly, the free ends of the guide vanes were cut off. Geometrical data about the stages used are tabulated. The runner blades were unshrouded but both ends of the guide vanes were let into the turbine frame, so that there were no leaks between them

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and the rotor. During the course of the investigations of each individually-produced stage, the angle of installation of the guide vanes was altered several times. The results of the tests are plotted in Fig.2 to 8, curves being given of efficiency, change of total pressure, change of reaction along the radius, change of efficiency as a function of gap between the rims, and others. The uniform pressure distribution beyond the discharge from the stage signifies that the stage investigated will be of high efficiency even when it is used as an intermediate stage over a wide range of velocity ratios. Numerous data on efficiency obtained when testing stages newly-formed by undercutting blades with the same angle of installation of the guide vanes showed that the efficiency commences to drop only when the blades are very short. The tests showed that undercutting the blades could increase the reaction, but this could be reduced to the optimum value by altering the angle of installation. The maximum value of stage efficiency is plotted

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as a function of the closed axial gap and the shape of the curve confirms the existing opinion that two main factors are particularly important in this case, namely the influence of variations in flow before the runner rim and losses due to friction in the angular surfaces. It is concluded that this method of forming the flow paths of turbines is simple and easy to make. It should afford the possibility of introducing extensive standardization of turbine stages. There are 8 figures, 1 table and 1 Soviet reference.

Card 4/4

ZAVADOVSKIY, Anatoliy Mikhaylovich. Prinimal uchastiye BABENKO, Kh.L., inzh. POVKH, I.L., prof., doktor tekhn.nauk, retsenzent; RODIN, K.G., kand.tekhn.nauk, red.; GOFMAN, Ye.K., red.izd-va; SHCHETININA, L.V., tekhn.red.

[Principles of designing the blading of steam and gas turbines] Osnovy proektirovaniia protochnoi chasti parovykh i gazovykh turbin. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 246 p. (MIRA 13:12)
(Steam turbines--Blades) (Gas turbines--Blades)

S/196/61/000/012/009/029
E194/E155

AUTHOR: Babenko, Kh.L.

TITLE: A comparison between calculated experimental data on high-pressure stages of a steam turbine

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.12, 1961, 29, abstract 12G 164. (Elektr. stantsii, no.1, 1961, 22-24)

TEXT: To check the recommendations of the TsKTI concerning aerodynamic calculation of turbine stages with full flow of working medium, not containing moisture, calculations are given of turbine sections which have passed tests at power stations. A comparative analysis was made for a 100 MW turbine manufactured in 1957. Actually measured values of flow path areas and steam flow rates were included in the calculation. In calculating nozzle areas the manufacturing works used values of $\sin \alpha_{1n}$, where α_{1n} is the discharge angle of the flow obtained from static tests on blading, whilst on the other hand the calculations of TsKTI were based on values of $\sin \alpha_{1\,eff}$ =

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AUTHOR: Babenko, Kh.L., Candidate of Technical Sciences

TITLE: An Investigation of a Gas-turbine Stage With a Low Ratio D_{av}/l_b (Stage Diameter/Blade Length)

PERIODICAL: Teploenergetika, 1961, No.2, pp. 24-28

TEXT: Large open-circuit gas turbines require long blades and the ratio of the mean stage diameter to the blade length may be very small (3 or less). Accordingly, two different model stages were developed and tested in the Central Boiler Turbine Institute in order to clear up the circumstances associated with the design and manufacture of long gas-turbine blades and to determine their characteristics. The flow path of the stage and the places at which measurements were made are indicated in Fig.1.

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An Investigation of a Gas-turbine Stage With a Low Ratio D_{av}/l_b (Stage Diameter/Blade Length)

Fig.1.

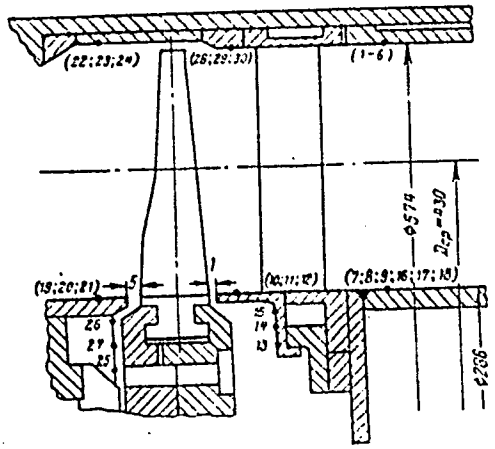

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Рис. 1.

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An Investigation of a Gas-turbine Stage With a Low Ratio D_{av}/ℓ_b (Stage Diameter/Blade Length)

The mean diameter was 430 mm, the guide vanes were 144 mm long, and the runner blades 146 mm long. The blades of runner No.1 had a chord of 40 mm; in runner No.2 the chord diminished from the root to the periphery as shown in Table 2. The twisting of the runner blades is described; the guide blades were untwisted. Both blades were tested separately with a velocity ratio of 0.5 to 1.0 and various values of mean axial gap at the mean diameter. The flow structure along the length and pitch of the blades was investigated under various conditions and graphs of degree of reaction over blade height are plotted in Fig.3. The turbine output was absorbed by a hydraulic brake. Curves of turbine efficiency as function of velocity ratio for the two stages are plotted in Figs 4 and 5. The shape of the efficiency curve is discussed; the maximum value of the circumferential efficiency is 0.96. A number of explanations of this high value are suggested. The experimental aerodynamic characteristics were in good agreement with calculated values over most of the height of the blades. Discordances

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An Investigation of a Gas-turbine Stage With a Low Ratio D_{av}/l_b (Stage Diameter/Blade Length)

between theory and experiment near the ends of the blades are discussed, with reference to graphs of calculated and experimental values of outlet angles over blade height in Fig.7. Fig.8 gives discharge characteristics for stage No.2, and results which can be obtained when stage No.2 is used as a model for designing the latter stages of full-sized gas turbines are given in Fig.3. There are 8 figures and 3 tables.

ASSOCIATION: Tsentral'nyy kotloturbinnyy institut
(Central Boiler Turbine Institute)

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